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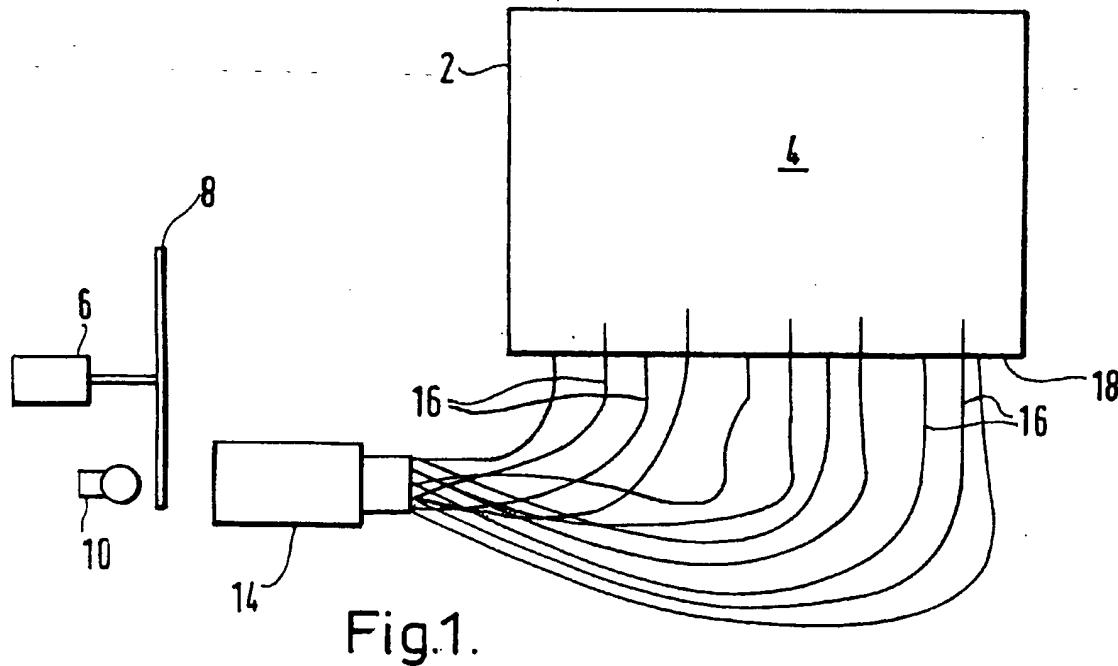
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(54) Abstract Title: Display simulating a flame effect

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(57) An optical display, preferably simulating the effect of flickering flames for use with an electric fire, is provided by directing white light, from a light source (10), through a rotating disc (8) having differently coloured segments. The light is then collected in a fibre optic harness (14) and directed to a partially transparent screen (2). At the screen (2), the optical fibres (16) are splayed out so as to direct their light into an edge of the screen (2) and also to its rear surface (fig 3, ref 19) so as to produce a colour-varying display of light thereon. The transparent screen (2) may be manufactured from glass or acrylic, and may be patterned.



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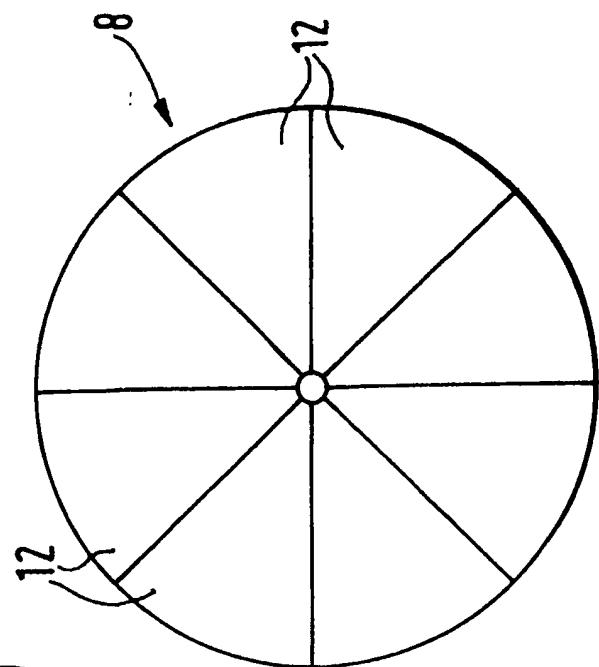


Fig. 2.

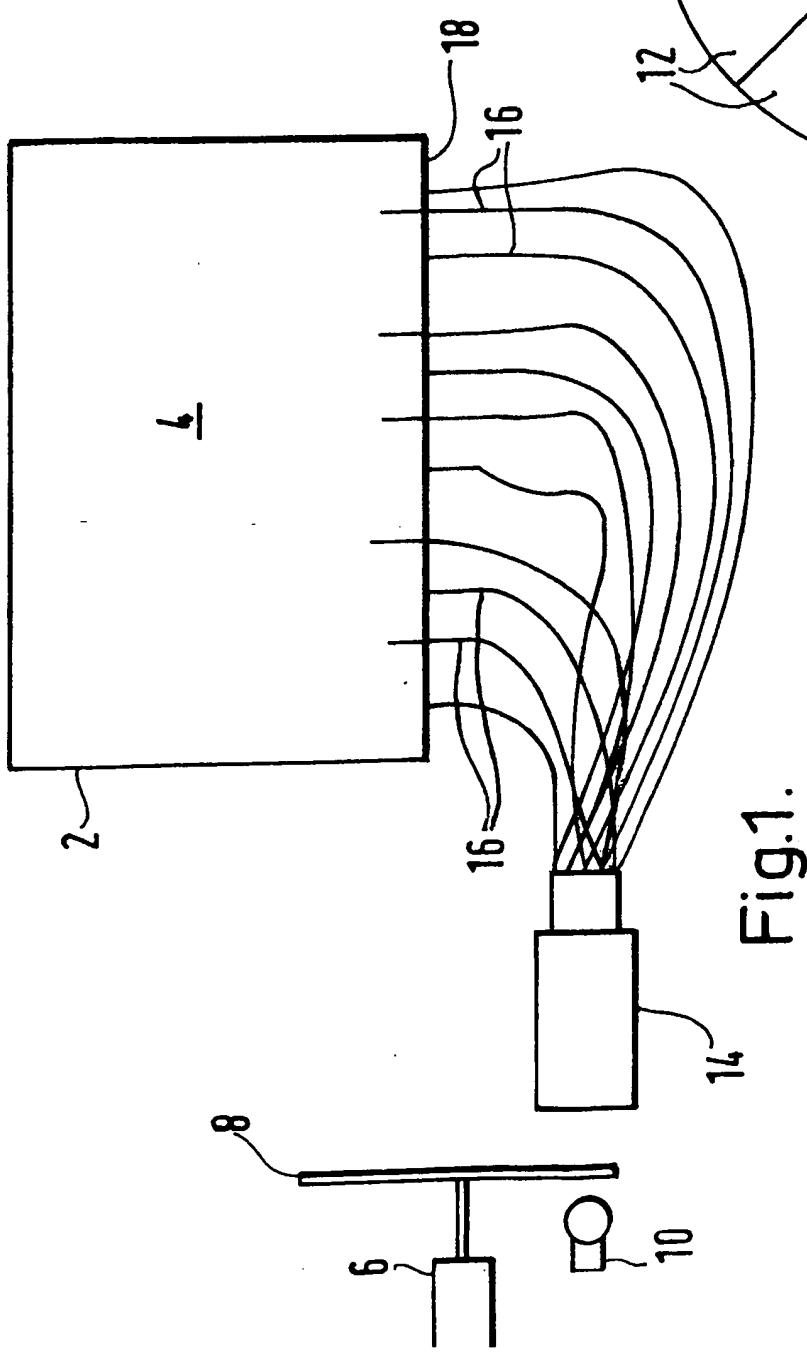


Fig. 1.

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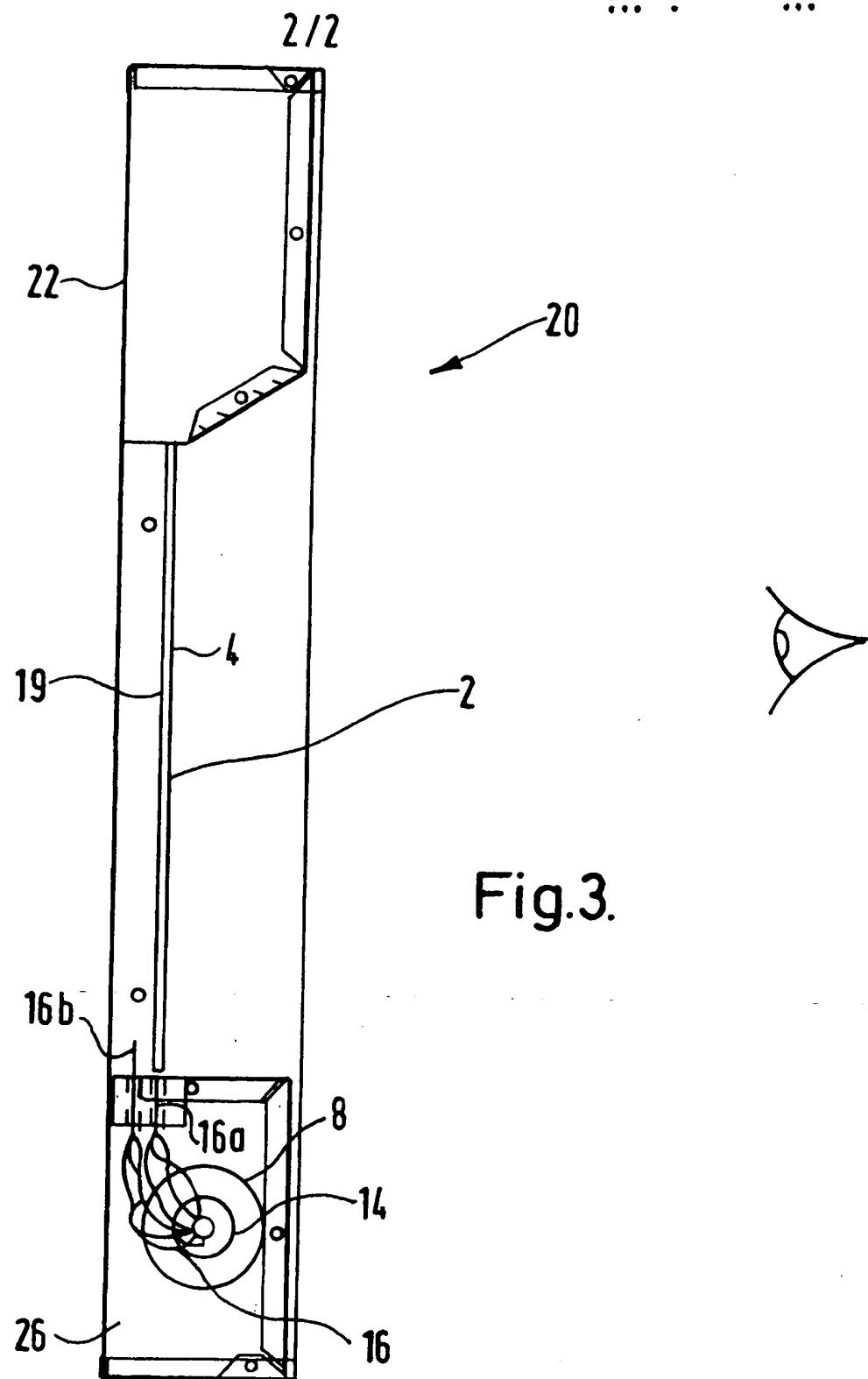


Fig.3.

## Display Arrangement

This invention relates to an arrangement for producing an optical display, and particularly, though not exclusively, to a display arrangement for use with an electric fire.

Whilst the simplest form of electric fires, or heaters, consist of an electric heating element and a rear reflector, it is also common for aesthetic reasons to provide a casing or cabinet that provides a visual effect. For example, a screen may be provided, usually 10 located above the heating elements, upon which is projected the image of flames flickering. The fire may be arranged to display the visual effect even when the heating elements are not operational.

Typically, such displays create the effect of flickering flames, often in association with 15 a surface representing a bed of fuel, for example a contoured surface simulating a coal fire.

In accordance with one aspect of the present invention, there is provided an arrangement for producing an optical display, for example for use with an electric fire, 20 the arrangement comprising a light source, a rotatably-mounted transparent or reflective member that comprises segments of different colours and which is mounted in front of the light source such that the light from the source passes through, or reflects from, the segments of the member successively, an at least partially transparent screen, and a

plurality of optical guides that are arranged to guides the light from the transparent or reflective member to the screen so as to produce said display thereon.

The rotatable member is preferably a disc radially divided into coloured segments, but it  
5 may also be in the form of a closed band or loop transversely divided into coloured  
segments. Any suitable number of segments may be provided.

The disc may be conveniently rotated about its axis by a motor, and the light source, for  
example a monochrome, preferably white, light source, such as a filament bulb, may be  
10 located behind the disc so as to direct its light onto an outer radial region thereof. Thus,  
as the disc rotates the light transmitted thereby will change successively from one  
colour to another as the different coloured segments pass in front of the light source.

The optical guides are preferably fibre optic cables. One end of the fibre optical cables,  
15 bundled into a harness, may have a lens associated therewith so as to focus the light  
coming from the rotatable member onto the cables, which light is then directed along  
the cables to their far ends, which advantageously are spread out such that the output is  
directed either into an edge, or onto a surface of the screen. When mounted in an  
electric fire, and when the optical guides are directed onto a surface of the screen, this is  
20 preferably the rear surface when the fire is viewed from the front.

Although typically the screen will be of generally planar, preferably rectilinear, for  
example rectangular, configuration, it will be appreciated that it may be of any other  
suitable shape, for example curved or of cylindrical configuration

Advantageously, a pattern is provided on or in the screen so as further to enhance the visual effect produced thereon by the display arrangement.

5 It will thus be appreciated, that as, for example, the coloured disc is rotated in front of the light source, a continually-varying colour display giving an impression of movement is produced over the surface of the screen.

Although it is envisaged that the display arrangement will find application with an 10 electric fire, with or without the heating elements thereof being operational, it is also envisaged that the display arrangement may be used alone. The latter application finds use, for example, in spaces, typically living spaces, that are centrally heated, where the display arrangement can act as a focal point.

15 An optical display arrangement, and an electrical fire incorporating such an arrangement, will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a schematic front view of the arrangement;

20 Figure 2 is a front view of one component of the arrangement of Figure 1; and Figure 3 is a schematic side view of an electric fire incorporating the arrangement of Figure 1.

Referring to the drawings, an arrangement for producing an optical display comprises a substantially vertically mounted rectangular glass screen 2, upon whose front surface 4 the display is to be produced.

- 5 A motor 6 drives a transparent wheel 8 such that it rotates vertically about a horizontal axis. A white light filament bulb 10 is mounted behind the wheel 8, at the same side as the motor 6, along a radius thereof so as to direct its light through the wheel 8 at a location adjacent the outer periphery thereof.
- 10 Figure 2 shows a front view of the wheel 8, divided into eight segments 12, each of which is of a different colour. Thus, as the wheel 8 rotates in front of the bulb 10, different colour light is successively transmitted thereby.

A fibre optic harness 14 is located in front of the wheel 8 so as to receive the light  
15 transmitted therethrough from the bulb 10. A lens (not shown) forms a front component of the harness 14 so as to focus the light onto the optical fibres. At the rear end of the harness 14, the individual optical fibres 16 are splayed out so as to form a linear array and are directed towards the bottom of the glass screen 2. As shown diagrammatically, some of the optical fibres 16 are directed to the lower edge 18 of the  
20 screen 2 such that light therefrom is transmitted through the bulk of the glass material, whilst others of the fibres 16 are directed onto the back surface 19 of the screen 2.

The screen 2 may be patterned, either by being sculpted or etched, or by having a pattern attached onto either the front 4 or back 19 surface thereof. The pattern may be any suitable pattern, for example depicting flowers, or abstract designs.

- 5 Referring to Figure 3, an electric fire 20 comprises a casing 22 in which the display screen 2 is vertically mounted towards the back thereof with heating elements (not shown) in an upper compartment thereof. The rotatable wheel 8 and the fibre optic harness 14 are mounted in a closed compartment 26 at the bottom of the fire 20.
- 10 The screen 2 when mounted in a room faces an observer 24. The individual optical fibres 16 are divided into two groups, such that a first group 16a directs light into the lower edge 18 of the screen 2, whilst the other group 16b directs light to the back surface 19 of the screen 2.
- 15 The observer 24 thus sees a changing coloured pattern on the screen 2, that can simulate flames from a solid fuel fire or any other suitable effect, including an abstract pattern. The displaying of the pattern is independent of the operation of heating elements (not shown) of the fire 20.

**Claims**

1. An arrangement for producing an optical display, the arrangement comprising a light source, a rotatably-mounted transparent or reflective member that comprises segments of different colours and which is mounted in front of the light source such that the light from the source passes through, or reflects from, the segments of the member successively, an at least partially transparent screen, and a plurality of optical guides that are arranged to guide the light passing from the transparent or reflective member to the screen so as to produce said display thereon.  
10
2. An arrangement according to claim 1, wherein the optical guides comprise fibre optic cables.
3. An arrangement according to claim 1 or 2, wherein the optical guides guide the light into an edge of the screen.  
15
4. An arrangement according to any one of the preceding claims, wherein the optical guides guide the light onto a surface of the screen.
- 20 5. An arrangement according to any one of the preceding claims, wherein the screen is of generally planer, preferably rectilinear, configuration, or is curved, preferably being of cylindrical configuration.
6. An arrangement according to any one of the preceding claims, wherein the screen is patterned.  
25
7. An arrangement according to any one of the preceding claims, wherein the screen is made of glass, or acrylic.
- 30 8. An arrangement according to any one of the preceding claims, wherein the optical guides form a bundle adjacent the rotatable member to receive coloured light

therefrom, and are subsequently spread out so as to distribute the light throughout the screen.

9. An arrangement according to any one of the preceding claims, wherein the  
5 rotatable member comprises a disc, or a closed band.

10. An arrangement for producing an optical display, substantially as hereinbefore  
described with reference to the accompanying drawings.

10 11. An electric fire including an arrangement in accordance with any one of the  
preceding claims, wherein the screen, in use, extends vertically, or inclined to the  
vertical.



INVESTOR IN PEOPLE

Application No: GB0329331.3

Examiner: Michael Prior

Claims searched: 1-11

Date of search: 12 May 2004

## Patents Act 1977: Search Report under Section 17

### Documents considered to be relevant:

| Category | Relevant to claims | Identity of document and passage or figure of particular reference                                |
|----------|--------------------|---|
| X        | 1-3, 5, 7-11       | GB 2256040 A<br>(BURLEY APPLIANCES) See whole document  |
| X        | 1, 2, 4-11         | US 5193901 A<br>(STONE) See column 4 line 58 - column 9 line 48, and figures                      |
| X        | 1, 2, 4, 5, 7-11   | GB 1043069 A<br>(MOBILCOLOR) See whole document, in particular page 2 lines 80 - 88, and figure 2 |
| X        | 1, 2, 4, 5, 7-11   | US 4738510 A<br>(SANSOM) See column 3 line 54 - column 4 line 15, and figure 1                    |
| X        | 1, 2, 4, 5, 7-9    | US 5558421 A<br>(GUASTELLA) See whole document, in particular column 4 line 15-23                 |

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|---|---|---|--|
| X | Document indicating lack of novelty or inventive step   | A | Document indicating technological background and/or state of the art.  |
| Y | Document indicating lack of inventive step if combined with one or more other documents of same category. | P | Document published on or after the declared priority date but before the filing date of this invention.          |
| & | Member of the same patent family  | E | Patent document published on or after, but with priority date earlier than, the filing date of this application. |

### Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC<sup>W</sup> :

F4R; F4W; G5C

Worldwide search of patent documents classified in the following areas of the IPC<sup>07</sup>

F24C; G09F

The following online and other databases have been used in the preparation of this search report

Online: EPODOC, WPI, JAPIO

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